G41MH/USB3 R2.0

User Manual

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(1) this device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.

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The Lithium battery adopted on this motherboard contains Perchlorate, a toxic substance controlled in Perchlorate Best Management Practices (BMP) regulations passed by the California Legislature. When you discard the Lithium battery in California, USA, please follow the related regulations in advance.
"Perchlorate Material-special handling may apply, see www.dtsc.ca.gov/hazardouswaste/perchlorate"

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Chapter 1: Introduction

Thank you for purchasing ASRock ***G41MH/USB3 R2.0*** motherboard, a reliable motherboard produced under ASRock's consistently stringent quality control. It delivers excellent performance with robust design conforming to ASRock's commitment to quality and endurance.

In this manual, chapter 1 and 2 contain introduction of the motherboard and step-by-step guide to the hardware installation. Chapter 3 and 4 contain the configuration guide to BIOS setup and information of the Support CD.

Because the motherboard specifications and the BIOS software might be updated, the content of this manual will be subject to change without notice. In case any modifications of this manual occur, the updated version will be available on ASRock website without further notice. You may find the latest VGA cards and CPU support lists on ASRock website as well. ASRock website http://www.asrock.com
If you require technical support related to this motherboard, please visit our website for specific information about the model you are using.
www.asrock.com/support/index.asp

1.1 Package Contents

ASRock ***G41MH/USB3 R2.0*** Motherboard
(Micro ATX Form Factor: 9.6-in x 8.4-in, 24.4 cm x 21.3 cm)
ASRock ***G41MH/USB3 R2.0*** Quick Installation Guide
ASRock ***G41MH/USB3 R2.0*** Support CD
Two Serial ATA (SATA) Data Cables (Optional)
One I/O Panel Shield

1.2 Specifications

Platform	- Micro ATX Form Factor: 9.6-in x 8.4-in, 24.4 cm x 21.3 cm - Solid Capacitor for CPU power
CPU	- LGA 775 for Intel® Core™ 2 Extreme / Core™ 2 Quad / Core™ 2 Duo / Pentium® Dual Core / Celeron® Dual Core / Celeron®, supporting Penryn Quad Core Yorkfield and Dual Core Wolfdale processors - Supports FSB1333/1066/800/533 MHz - Supports Hyper-Threading Technology (see **CAUTION 1**) - Supports Untied Overclocking Technology (see **CAUTION 2**) - Supports EM64T CPU
Chipset	- Northbridge: Intel® G41 - Southbridge: Intel® ICH7
Memory	- Dual Channel DDR3 Memory Technology (see **CAUTION 3**) - 2 x DDR3 DIMM slots - Support DDR3 1333(OC)/1066/800 non-ECC, un-buffered memory (see **CAUTION 4**) - Max. capacity of system memory: 8GB (see **CAUTION 5**)
Expansion Slot	- 1 x PCI Express x16 slot - 1 x PCI Express x1 slot - 2 x PCI slots
Graphics	- Intel® Graphics Media Accelerator X4500 - Pixel Shader 4.0, DirectX 10 - Max. shared memory 1759MB (see **CAUTION 6**) - Three VGA Output options: D-Sub, DVI-D and HDMI - Supports HDMI Technology with max. resolution up to 1920x1200 (1080P) - Supports DVI with max. resolution up to 1920x1200 @ 75Hz - Supports D-Sub with max. resolution up to 2048x1536 @ 60Hz - Supports HDCP function with DVI and HDMI ports - Supports Full HD 1080p Blu-ray (BD) / HD-DVD playback with DVI and HDMI ports
Audio	- 5.1 CH HD Audio (VIA® VT1705 Audio Codec)
LAN	- PCIE x1 Gigabit LAN 10/100/1000 Mb/s - Realtek RTL8111E - Supports Wake-On-LAN - Supports LAN Cable Detection - Supports Energy Efficient Ethernet 802.3az - Supports PXE

Rear Panel I/O	I/O Panel - 1 x PS/2 Mouse Port - 1 x PS/2 Keyboard Port - 1 x VGA/D-Sub Port - 1 x VGA/DVI-D Port - 1 x HDMI Port - 2 x Ready-to-Use USB 2.0 Ports - 2 x Ready-to-Use USB 3.0 Ports - 1 x RJ-45 LAN Port with LED (ACT/LINK LED and SPEED LED) - HD Audio Jack: Line in/Front Speaker/Microphone
USB 3.0	- 2 x USB 3.0 ports by ASMedia ASM1042, support USB 1.0/ 2.0/3.0 up to 5Gb/s
Connector	- 4 x SATAII 3.0 Gb/s connectors (No Support for RAID and "Hot Plug" functions) (see **CAUTION 7**) - 1 x ATA100 IDE connector (supports 2 x IDE devices) - 1 x Floppy connector - 1 x IR header - 1 x Print port header - 1 x COM port header - 1 x TPM header - CPU/Chassis/Power FAN connector - 24 pin ATX power connector - 4 pin 12V power connector - CD in header - Front panel audio connector - 2 x USB 2.0 headers (support 4 USB 2.0 ports)
BIOS Feature	- 8Mb AMI BIOS - AMI Legal BIOS - Supports "Plug and Play" - ACPI 1.1 Compliance Wake Up Events - Supports jumperfree - AMBIOS 2.3.1 Support - Supports I. O. T. (Intelligent Overclocking Technology)
Support CD	- Drivers, Utilities, AntiVirus Software (Trial Version), CyberLink MediaEspresso 6.5 Trial, ASRock Software Suite (CyberLink DVD Suite - OEM and Trial; Creative Sound Blaster X-Fi MB - Trial)
Unique Feature	- ASRock OC Tuner (see **CAUTION 8**) - ASRock Intelligent Energy Saver (see **CAUTION 9**) - ASRock Instant Boot - ASRock Instant Flash (see **CAUTION 10**) - ASRock OC DNA (see **CAUTION 11**)

	- ASRock APP Charger (see **CAUTION 12**) - ASRock SmartView (see **CAUTION 13**) - ASRock XFast USB (see **CAUTION 14**) - Hybrid Booster: - CPU Frequency Stepless Control (see **CAUTION 15**) - ASRock U-COP (see **CAUTION 16**) - Boot Failure Guard (B.F.G.)
Hardware Monitor	- CPU Temperature Sensing - Chassis Temperature Sensing - CPU/Chassis/Power Fan Tachometer - CPU Quiet Fan - Voltage Monitoring: +12V, +5V, +3.3V, CPU Vcore
OS	- Microsoft® Windows® 7 / 7 64-bit / Vista™ / Vista™ 64-bit / XP / XP 64-bit compliant
Certifications	- FCC, CE, WHQL - ErP/EuP Ready (ErP/EuP ready power supply is required) (see **CAUTION 17**)

* For detailed product information, please visit our website: http://www.asrock.com

WARNING

Please realize that there is a certain risk involved with overclocking, including adjusting the setting in the BIOS, applying Untied Overclocking Technology, or using the third-party overclocking tools. Overclocking may affect your system stability, or even cause damage to the components and devices of your system. It should be done at your own risk and expense. We are not responsible for possible damage caused by overclocking.

CAUTION!

1. About the setting of "Hyper Threading Technology", please check page 37.
2. This motherboard supports Untied Overclocking Technology. Please read "Untied Overclocking Technology" on page 28 for details.
3. This motherboard supports Dual Channel Memory Technology. Before you implement Dual Channel Memory Technology, make sure to read the installation guide of memory modules on page 17 for proper installation.
4. Please check the table below for the CPU FSB frequency and its corresponding memory support frequency.

CPU FSB Frequency	Memory Support Frequency
1333	DDR3 800, DDR3 1066, DDR3 1333
1066	DDR3 800, DDR3 1066
800	DDR3 800
533	DDR3 800

* DDR3 1333 memory modules will operate in overclocking mode.

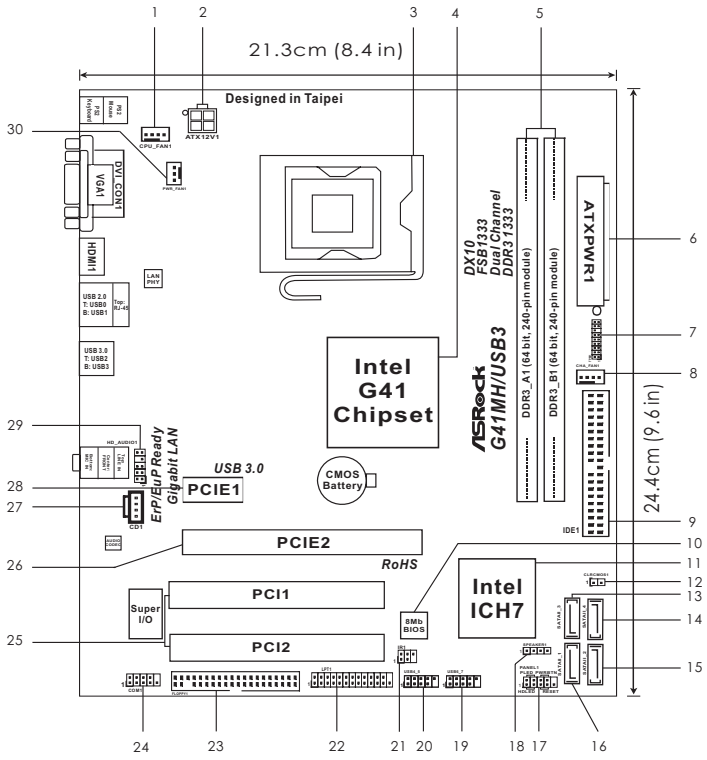
* When you use a FSB533-CPU on this motherboard, it will run at DDR3 533 if you adopt a DDR3 800 memory module.

5. Due to the operating system limitation, the actual memory size may be less than 4GB for the reservation for system usage under Windows® 7 / Vista™ / XP. For Windows® OS with 64-bit CPU, there is no such limitation.
6. The maximum shared memory size is defined by the chipset vendor and is subject to change. Please check Intel® website for the latest information.
7. Before installing SATAII hard disk to SATAII connector, please read the "SATAII Hard Disk Setup Guide" on page 27 to adjust your SATAII hard disk drive to SATAII mode. You can also connect SATA hard disk to SATAII connector directly.
8. It is a user-friendly ASRock overclocking tool which allows you to surveil your system by hardware monitor function and overclock your hardware devices to get the best system performance under Windows® environment. Please visit our website for the operation procedures of ASRock OC Tuner. ASRock website: http://www.asrock.com
9. Featuring an advanced proprietary hardware and software design, Intelligent Energy Saver is a revolutionary technology that delivers unparalleled power savings. In other words, it is able to provide exceptional power saving and improve power efficiency without sacrificing computing performance. Please visit our website for the operation procedures of Intelligent Energy Saver.
   ASRock website: http://www.asrock.com
10. ASRock Instant Flash is a BIOS flash utility embedded in Flash ROM. This convenient BIOS update tool allows you to update system BIOS without entering operating systems first like MS-DOS or Windows®. With this utility, you can press <F6> key during the POST or press <F2> key to BIOS setup menu to access ASRock Instant Flash. Just launch this tool and save the new BIOS file to your USB flash drive, floppy disk or hard drive, then you can update your BIOS only in a few clicks without preparing an additional floppy diskette or other complicated flash utility. Please be noted that the USB flash drive or hard drive must use FAT32/16/12 file system.
11. The software name itself – OC DNA literally tells you what it is capable of. OC DNA, an exclusive utility developed by ASRock, provides a convenient way for the user to record the OC settings and share with others. It helps you to save your overclocking record under the operating system and simplifies the complicated recording process of overclocking settings. With OC DNA, you can save your OC settings as a profile and share with your friends! Your friends then can load the OC profile to their own system to get the same OC settings as yours! Please be noticed that the OC profile can only be shared and worked on the same motherboard.
12. If you desire a faster, less restricted way of charging your Apple devices, such as iPhone/iPod/iPad Touch, ASRock has prepared a wonderful solution for you - ASRock APP Charger. Simply installing the APP Charger driver, it makes your iPhone charged much quickly from your computer and up to 40% faster than before. ASRock APP Charger allows you to quickly charge many Apple devices simultaneously and even supports

continuous charging when your PC enters into Standby mode (S1), Suspend to RAM (S3), hibernation mode (S4) or power off (S5). With APP Charger driver installed, you can easily enjoy the marvelous charging experience than ever.
ASRock website: http://www.asrock.com/Feature/AppCharger/index.asp

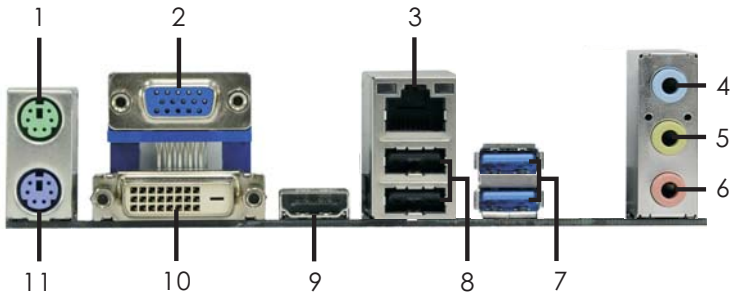
13. SmartView, a new function of internet browser, is the smart start page for IE that combines your most visited web sites, your history, your Facebook friends and your real-time newsfeed into an enhanced view for a more personal Internet experience. ASRock motherboards are exclusively equipped with the SmartView utility that helps you keep in touch with friends on-the-go. To use SmartView feature, please make sure your OS version is Windows® 7 / 7 64 bit / Vista™ / Vista™ 64 bit, and your browser version is IE8.
ASRock website: http://www.asrock.com/Feature/SmartView/index.asp
14. ASRock XFast USB can boost USB storage device performance. The performance may depend on the property of the device.
15. Although this motherboard offers stepless control, it is not recommended to perform over-clocking. Frequencies other than the recommended CPU bus frequencies may cause the instability of the system or damage the CPU.
16. While CPU overheat is detected, the system will automatically shutdown. Before you resume the system, please check if the CPU fan on the motherboard functions properly and unplug the power cord, then plug it back again. To improve heat dissipation, remember to spray thermal grease between the CPU and the heatsink when you install the PC system.
17. EuP, stands for Energy Using Product, was a provision regulated by European Union to define the power consumption for the completed system. According to EuP, the total AC power of the completed system shall be under 1.00W in off mode condition. To meet EuP standard, an EuP ready motherboard and an EuP ready power supply are required. According to Intel's suggestion, the EuP ready power supply must meet the standard of 5v standby power efficiency is higher than 50% under 100 mA current consumption. For EuP ready power supply selection, we recommend you checking with the power supply manufacturer for more details.

1.3 Motherboard Layout



1	CPU Fan Connector (CPU_FAN1)	17	System Panel Header (PANEL1, White)
2	ATX 12V Connector (ATX12V1)	18	Chassis Speaker Header (SPEAKER 1, White)
3	775-Pin CPU Socket	19	USB 2.0 Header (USB6_7, Blue)
4	North Bridge Controller	20	USB 2.0 Header (USB4_5, Blue)
5	2 x 240-pin DDR3 DIMM Slots (Dual Channel: DDR3_A1, DDR3_B1; Blue)	21	Infrared Module Header (IR1)
6	ATX Power Connector (ATXPWR1)	22	Print Port Header (LPT1, White)
7	TPM Header (TPM1)	23	Floppy Connector (FLOPPY1)
8	Chassis Fan Connector (CHA_FAN1)	24	Serial Port Connector (COM1)
9	IDE1 Connector (IDE1, Blue)	25	PCI Slots (PCI1- 2)
10	BIOS SPI Chip	26	PCI Express x16 Slot (PCIE2)
11	South Bridge Controller	27	Internal Audio Connector: CD1 (Black)
12	Clear CMOS Jumper (CLRCMOS1)	28	PCI Express x1 Slot (PCIE1)
13	Third SATAII Connector (SATAII_3; Blue)	29	Front Panel Audio Header (HD_AUDIO1, White)
14	Fourth SATAII Connector (SATAII_4; Blue)	30	Power Fan Connector (PWR_FAN1)
15	Secondary SATAII Connector (SATAII_2; Blue)		
16	Primary SATAII Connector (SATAII_1; Blue)		

1.4 I/O Panel



1	PS/2 Mouse Port (Green	*** 7	USB 3.0 Ports (USB23)
2	VGA/D-Sub Port	8	USB 2.0 Ports (USB01)
* 3	LAN RJ-45 Port	9	HDMI Port
4	Line In (Light Blue)	10	VGA/DVI-D Port
** 5	Front Speaker (Lime)	11	PS/2 Keyboard Port (Purple)
6	Microphone (Pink)		

* There are two LED next to the LAN port. Please refer to the table below for the LAN port LED indications.

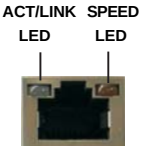
LAN Port LED Indications

Activity/Link LED

Status	Description
Off	No Link
Blinking	Data Activity
On	Link

SPEED LED

Status	Description
Off	10Mbps connection
Orange	100Mbps connection
Green	1Gbps connection



LAN Port

** To enable Multi-Streaming function, you need to connect a front panel audio cable to the front panel audio header. After restarting your computer, you will find "VIA HD Audio Deck" tool on your system. Please follow below instructions according to the OS you install.

For Windows® XP / XP 64-bit OS:

Please click "VIA HD Audio Deck" icon , and click "Speaker". Then you are allowed to select "2 Channel" or "4 Channel". Click "Power" to save your change.

For Windows® 7 / 7 64-bit / Vista™ / Vista™ 64-bit OS:

Please click "VIA HD Audio Deck" icon , and click "Advanced Options" on the left side on the bottom. In "Advanced Options" screen, select "Independent Headphone", and click "OK" to save your change.

*** Please do not connect USB Keyboard and Mouse on USB 3.0 ports. Besides, USB 3.0 ports do not support Wake Up function.

Chapter 2: Installation

This is a Micro ATX form factor (9.6" x 8.4", 24.4 x 21.3 cm) motherboard. Before you install the motherboard, study the configuration of your chassis to ensure that the motherboard fits into it.

Make sure to unplug the power cord before installing or removing the motherboard. Failure to do so may cause physical injuries to you and damages to motherboard components.

2.1 Screw Holes

Place screws into the holes indicated by circles to secure the motherboard to the chassis.

Do not over-tighten the screws! Doing so may damage the motherboard.

2.2 Pre-installation Precautions

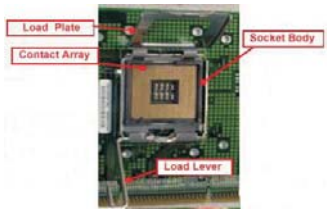
Take note of the following precautions before you install motherboard components or change any motherboard settings.

1. Unplug the power cord from the wall socket before touching any component.
2. To avoid damaging the motherboard components due to static electricity, NEVER place your motherboard directly on the carpet or the like. Also remember to use a grounded wrist strap or touch a safety grounded object before you handle components.
3. Hold components by the edges and do not touch the ICs.
4. Whenever you uninstall any component, place it on a grounded antistatic pad or in the bag that comes with the component.

Before you install or remove any component, ensure that the power is switched off or the power cord is detached from the power supply.
Failure to do so may cause severe damage to the motherboard, peripherals, and/or components.

2.3 CPU Installation

For the installation of Intel 775-LAND CPU, please follow the steps below.



775-Pin Socket Overview

Before you insert the 775-LAND CPU into the socket, please check if the CPU surface is unclean or if there is any bent pin on the socket. Do not force to insert the CPU into the socket if above situation is found. Otherwise, the CPU will be seriously damaged.

Step 1. Open the socket:

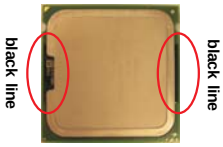
Step 1-1. Disengaging the lever by depressing down and out on the hook to clear retention tab.

Step 1-2. Rotate the load lever to fully open position at approximately 135 degrees.

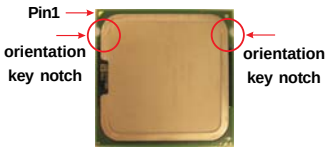
Step 1-3. Rotate the load plate to fully open position at approximately 100 degrees.

Step 2. Insert the 775-LAND CPU:

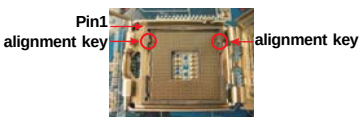
Step 2-1. Hold the CPU by the edges where are marked with black lines.



Step 2-2. Orient the CPU with IHS (Integrated Heat Sink) up. Locate Pin1 and the two orientation key notches.



775-LAND CPU



775-Pin Socket

For proper inserting, please ensure to match the two orientation key notches of the CPU with the two alignment keys of the socket.

Step 2-3. Carefully place the CPU into the socket by using a purely vertical motion.
Step 2-4. Verify that the CPU is within the socket and properly mated to the orient keys.

Step 3. Remove PnP Cap (Pick and Place Cap):
Use your left hand index finger and thumb to support the load plate edge, engage PnP cap with right hand thumb and peel the cap from the socket while pressing on center of PnP cap to assist in removal.

1. It is recommended to use the cap tab to handle and avoid kicking off the PnP cap.
2. This cap must be placed if returning the motherboard for after service.

Step 4. Close the socket:
Step 4-1. Rotate the load plate onto the IHS.
Step 4-2. While pressing down lightly on load plate, engage the load lever.
Step 4-3. Secure load lever with load plate tab under retention tab of load lever.

2.4 Installation of CPU Fan and Heatsink

This motherboard is equipped with 775-Pin socket that supports Intel 775-LAND CPU. Please adopt the type of heatsink and cooling fan compliant with Intel 775-LAND CPU to dissipate heat. Before you installed the heatsink, you need to spray thermal interface material between the CPU and the heatsink to improve heat dissipation. Ensure that the CPU and the heatsink are securely fastened and in good contact with each other. Then connect the CPU fan to the CPU_FAN connector (CPU_FAN1, see page 11, No. 1).

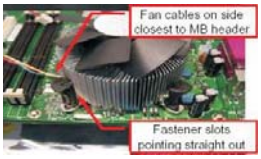
For proper installation, please kindly refer to the instruction manuals of your CPU fan and heatsink.

Below is an example to illustrate the installation of the heatsink for 775-LAND CPU.

Step 1. Apply thermal interface material onto center of IHS on the socket surface.

Step 2. Place the heatsink onto the socket. Ensure fan cables are oriented on side closest to the CPU fan connector on the motherboard (CPU_FAN1, see page 11, No. 1).

Step 3. Align fasteners with the motherboard throughholes.



Step 4. Rotate the fastener clockwise, then press down on fastener caps with thumb to install and lock. Repeat with remaining fasteners.

If you press down the fasteners without rotating them clockwise, the heatsink cannot be secured on the motherboard.

Step 5. Connect fan header with the CPU fan connector on the motherboard.

Step 6. Secure excess cable with tie-wrap to ensure cable does not interfere with fan operation or contact other components.

2.5 Installation of Memory Modules (DIMM)

G41MH/USB3 R2.0 motherboard provides two 240-pin DDR3 (Double Data Rate 3) DIMM slots, and supports Dual Channel Memory Technology. For dual channel configuration, you always need to install two **identical** (the same brand, speed, size and chip-type) memory modules in the DDR3 DIMM slots to activate Dual Channel Memory Technology. Otherwise, it will operate at single channel mode.

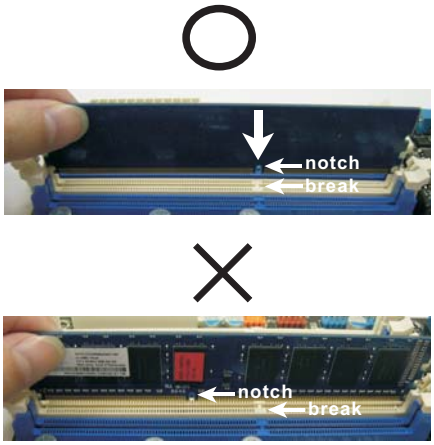
1. It is not allowed to install a DDR or DDR2 memory module into DDR3 slot;otherwise, this motherboard and DIMM may be damaged.
2. If you install only one memory module or two non-identical memory modules, it is unable to activate the Dual Channel Memory Technology.

Installing a DIMM

Please make sure to disconnect power supply before adding or removing DIMMs or the system components.

Step 1. Unlock a DIMM slot by pressing the retaining clips outward.

Step 2. Align a DIMM on the slot such that the notch on the DIMM matches the break on the slot.



The DIMM only fits in one correct orientation. It will cause permanent damage to the motherboard and the DIMM if you force the DIMM into the slot at incorrect orientation.

Step 3. Firmly insert the DIMM into the slot until the retaining clips at both ends fully snap back in place and the DIMM is properly seated.

2.6 Expansion Slots (PCI and PCI Express Slots)

There are 2 PCI slots and 2 PCI Express slots on this motherboard.

PCI slots: PCI slots are used to install expansion cards that have the 32-bit PCI interface.

PCIE slots:

PCIE1 (PCIE x1 slot) is used for PCI Express cards with x1 lane width cards, such as Gigabit LAN card, SATA2 card, etc.

PCIE2 (PCIE x16 slot) is used for PCI Express cards with x16 lane width graphics cards.

If you install the add-on PCI Express VGA card or other PCIE device to PCIE2 (PCIE x16 slot), only D-Sub port will be enabled. DVI-D and HDMI ports will not work.

Installing an expansion card

Step 1. Before installing the expansion card, please make sure that the power supply is switched off or the power cord is unplugged. Please read the documentation of the expansion card and make necessary hardware settings for the card before you start the installation.

Step 2. Remove the bracket facing the slot that you intend to use. Keep the screws for later use.

Step 3. Align the card connector with the slot and press firmly until the card is completely seated on the slot.

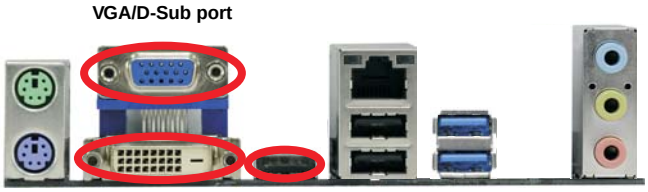
Step 4. Fasten the card to the chassis with screws.

2.7 Dual Monitor Feature

This motherboard supports dual monitor feature. With the internal VGA output support (DVI-D, D-Sub and HDMI), you can easily enjoy the benefits of dual monitor feature without installing any add-on VGA card to this motherboard. This motherboard also provides independent display controllers for DVI-D, D-Sub and HDMI to support dual VGA output so that DVI-D, D-sub and HDMI can drive same or different display contents.

To enable dual monitor feature, please follow the below steps:

1. Connect DVI-D monitor cable to VGA/DVI-D port on the I/O panel, connect D-Sub monitor cable to VGA/D-Sub port on the I/O panel, or connect HDMI monitor cable to HDMI port on the I/O panel.



2. If you have installed onboard VGA driver from our support CD to your system already, you can freely enjoy the benefits of dual monitor function after your system boots. If you haven't installed onboard VGA driver yet, please install onboard VGA driver from our support CD to your system and restart your computer.

1. D-Sub, DVI-D and HDMI ports cannot be connected simultaneously. You can choose to use two of them only.
2. When you playback HDCP-protected video from Blu-ray (BD) or HD-DVD disc, the content will be displayed only in one of the monitors.

3. Set up a dual-monitor display.

For Windows® XP / XP 64-bit OS:

Right click the desktop, choose “Properties”, and select the “Settings” tab so that you can adjust the parameters of the dual-monitor according to the steps below.

A. Click the “Identify” button to display a large number on each monitor.

B. Right-click the display icon in the Display Properties dialog that you wish to be your primary monitor, and then select “Primary”. When you use multiple monitors with your card, one monitor will always be Primary, and all additional monitors will be designated as Secondary.

C. Select the display icon identified by the number 2.

D. Click “Extend my Windows desktop onto this monitor”.

E. Right-click the display icon and select “Attached”, if necessary.

F. Set the “Screen Resolution” and “Color Quality” as appropriate for the second monitor. Click “Apply” or “OK” to apply these new values.

G. Repeat steps C through E for the diaplay icon identified by the number one and two.

For Windows® 7 / 7 64-bit / Vista™ / Vista™ 64-bit OS:

Right click the desktop, choose “Personalize”, and select the “Display Settings” tab so that you can adjust the parameters of the dual-monitor according to the steps below.

A. Click the number ”2” icon.

B. Click the items “This is my main monitor” and “Extend the desktop onto this monitor”.

C. Click “OK” to save your change.

D. Repeat steps A through C for the display icon identified by the number two.

6. Use Daul Monitor. Click and drag the display icons to positions representing the physical setup of your monitors that you would like to use. The placement of display icons determines how you move items from one monitor to another.

HDCP Function

HDCP function is supported on this motherboard. To use HDCP function with this motherboard, you need to adopt the monitor that supports HDCP function as well. Therefore, you can enjoy the superior display quality with high-definition HDCP encryption contents. Please refer to below instruction for more details about HDCP function.

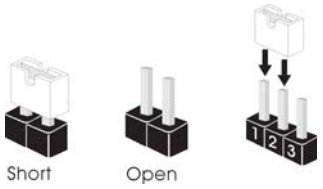
What is HDCP?

HDCP stands for High-Bandwidth Digital Content Protection, a specification developed by Intel® for protecting digital entertainment content that uses the DVI interface. HDCP is a copy protection scheme to eliminate the possibility of intercepting digital data midstream between the video source, or transmitter - such as a computer, DVD player or set-top box - and the digital display, or receiver - such as a monitor, television or projector. In other words, HDCP specification is designed to protect the integrity of content as it is being transmitted.

Products compatible with the HDCP scheme such as DVD players, satellite and cable HDTV set-top-boxes, as well as few entertainment PCs requires a secure connection to a compliant display. Due to the increase in manufacturers employing HDCP in their equipment, it is highly recommended that the HDTV or LCD monitor you purchase is compatible.

2.8 Jumpers Setup

The illustration shows how jumpers are setup. When the jumper cap is placed on pins, the jumper is "Short". If no jumper cap is placed on pins, the jumper is "Open". The illustration shows a 3-pin jumper whose pin1 and pin2 are "Short" when jumper cap is placed on these 2 pins.



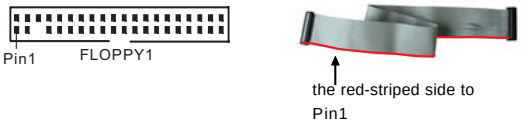
Jumper	Setting	Description
Clear CMOS (CLRCMOS1, 2-pin jumper) (see p.11 No. 12)	 2-pin jumper	

Note: CLRCMOS1 allows you to clear the data in CMOS. The data in CMOS includes system setup information such as system password, date, time, and system setup parameters. To clear and reset the system parameters to default setup, please turn off the computer and unplug the power cord from the power supply. After waiting for 15 seconds, use a jumper cap to short 2 pins on CLRCMOS1 for 5 seconds.

2.9 Onboard Headers and Connectors

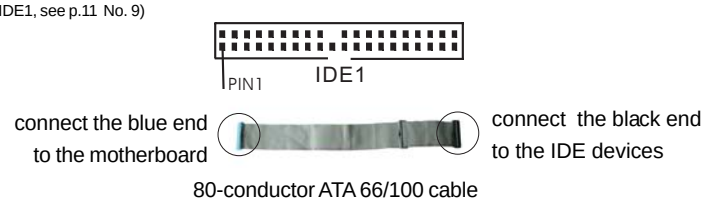
Onboard headers and connectors are NOT jumpers. Do NOT place jumper caps over these headers and connectors. Placing jumper caps over the headers and connectors will cause permanent damage of the motherboard!

FDD connector
(33-pin FLOPPY1)
(see p.11 No. 23)



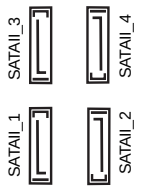
Note: Make sure the red-striped side of the cable is plugged into Pin1 side of the connector.

Primary IDE connector (Blue)
(39-pin IDE1, see p.11 No. 9)



Note: Please refer to the instruction of your IDE device vendor for the details.

Serial ATAII Connectors
(SATAII_1: see p.11, No. 16)
(SATAII_2: see p.11, No. 15)
(SATAII_3: see p.11, No. 13)
(SATAII_4: see p.11, No. 14)



These four Serial ATAII (SATAII) connectors support SATA data cables for internal storage devices. The current SATAII interface allows up to 3.0 Gb/s data transfer rate.

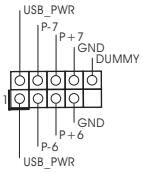
Serial ATA (SATA) Data Cable
(Optional)

Either end of the SATA data cable can be connected to the SATA / SATAII hard disk or the SATAII connector on this motherboard.

USB 2.0 Headers

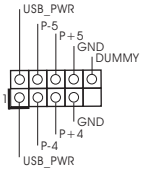
(9-pin USB6_7)

(see p.11 No. 19)



(9-pin USB4_5)

(see p.11 No. 20)

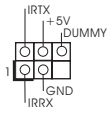


Besides two default USB 2.0 ports on the I/O panel, there are two USB 2.0 headers on this motherboard. Each USB 2.0 header can support two USB 2.0 ports.

Infrared Module Header

(5-pin IR1)

(see p.11 No. 21)

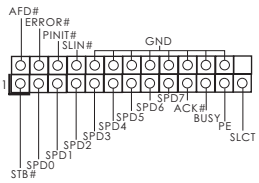


This header supports an optional wireless transmitting and receiving infrared module.

Print Port Header

(25-pin LPT1)

(see p.11 No. 22)

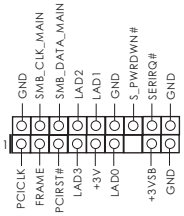


This is an interface for print port cable that allows convenient connection of printer devices.

TPM Header

(17-pin TPM1)

(see p.11 No. 7)



This connector supports a Trusted Platform Module (TPM) system, which can securely store keys, digital certificates, passwords, and data. A TPM system also helps enhance network security, protects digital identities, and ensures platform integrity.

Internal Audio Connectors

(4-pin CD1)

(CD1: see p.11 No. 27)

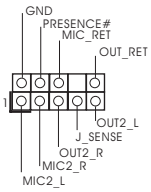
CD1

This connector allows you to receive stereo audio input from sound sources such as a CD-ROM, DVD-ROM, TV tuner card, or MPEG card.

Front Panel Audio Header

(9-pin HD_AUDIO1)

(see p.11 No. 29)



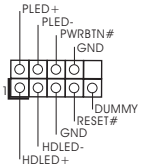
This is an interface for front panel audio cable that allows convenient connection and control of audio devices.

1. High Definition Audio supports Jack Sensing, but the panel wire on the chassis must support HDA to function correctly. Please follow the instruction in our manual and chassis manual to install your system.
2. If you use AC'97 audio panel, please install it to the front panel audio header as below:
   A. Connect Mic_IN (MIC) to MIC2_L.
   B. Connect Audio_R (RIN) to OUT2_R and Audio_L (LIN) to OUT2_L.
   C. Connect Ground (GND) to Ground (GND).
   D. MIC_RET and OUT_RET are for HD audio panel only. You don't need to connect them for AC'97 audio panel.

System Panel Header

(9-pin PANEL1)

(see p.11 No. 17)

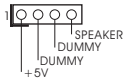


This header accommodates several system front panel functions.

Chassis Speaker Header

(4-pin SPEAKER 1)

(see p.11 No. 18)

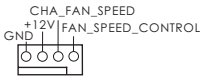


Please connect the chassis speaker to this header.

Chassis and Power Fan Connectors

(4-pin CHA_FAN1)

(see p.11 No. 8)



(3-pin PWR_FAN1)

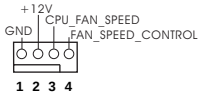
(see p.11 No. 30)

Please connect the fan cables to the fan connectors and match the black wire to the ground pin.

CPU Fan Connector

(4-pin CPU_FAN1)

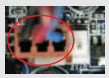
(see p.11 No. 1)



Please connect a CPU fan cable to this connector and match the black wire to the ground pin.

Though this motherboard provides 4-Pin CPU fan (Quiet Fan) support, the 3-Pin CPU fan still can work successfully even without the fan speed control function. If you plan to connect the 3-Pin CPU fan to the CPU fan connector on this motherboard, please connect it to Pin 1-3.

Pin 1-3 Connected

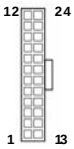


3-Pin Fan Installation

ATX Power Connector

(24-pin ATXPWR1)

(see p.11 No. 6)



Please connect an ATX power supply to this connector.

Though this motherboard provides 24-pin ATX power connector, it can still work if you adopt a traditional 20-pin ATX power supply. To use the 20-pin ATX power supply, please plug your power supply along with Pin 1 and Pin 13.

20-Pin ATX Power Supply Installation

ATX 12V Power Connector

(4-pin ATX12V1)

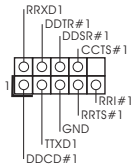
(see p.11 No. 2)

Please connect an ATX 12V power supply to this connector.

Serial port Header

(9-pin COM1)

(see p.11 No.24)

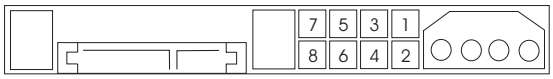


This COM1 header supports a serial port module.

2.10 SATAII Hard Disk Setup Guide

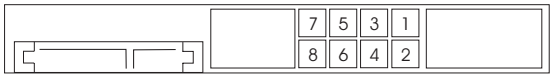
Before installing SATAII hard disk to your computer, please carefully read below SATAII hard disk setup guide. Some default setting of SATAII hard disks may not be at SATAII mode, which operate with the best performance. In order to enable SATAII function, please follow the below instruction with different vendors to correctly adjust your SATAII hard disk to SATAII mode in advance; otherwise, your SATAII hard disk may fail to run at SATAII mode.

Western Digital



If pin 5 and pin 6 are shorted, SATA 1.5Gb/s will be enabled.
On the other hand, if you want to enable SATAII 3.0Gb/s, please remove the jumpers from pin 5 and pin 6.

SAMSUNG



If pin 3 and pin 4 are shorted, SATA 1.5Gb/s will be enabled.
On the other hand, if you want to enable SATAII 3.0Gb/s, please remove the jumpers from pin 3 and pin 4.

HITACHI

Please use the Feature Tool, a DOS-bootable tool, for changing various ATA features. Please visit HITACHI's website for details:
http://www.hitachigst.com/hdd/support/download.htm

The above examples are just for your reference. For different SATAII hard disk products of different vendors, the jumper pin setting methods may not be the same. Please visit the vendors' website for the updates.

2.11 Serial ATA (SATA) / Serial ATAII (SATAII) Hard Disks Installation

This motherboard adopts Intel® ICH7 south bridge chipset that supports Serial ATA (SATA) / Serial ATAII (SATAII) hard disks. You may install SATA / SATAII hard disks on this motherboard for internal storage devices. This section will guide you to install the SATA / SATAII hard disks.

STEP 1: Install the SATA / SATAII hard disks into the drive bays of your chassis.
STEP 2: Connect the SATA power cable to the SATA / SATAII hard disk.
STEP 3: Connect one end of the SATA data cable to the motherboard's SATAII connector.
STEP 4: Connect the other end of the SATA data cable to the SATA / SATAII hard disk.

2.12 Driver Installation Guide

To install the drivers to your system, please insert the support CD to your optical drive first. Then, the drivers compatible to your system can be auto-detected and listed on the support CD driver page. Please follow the order from up to bottom side to install those required drivers. Therefore, the drivers you install can work properly.

2.13 Untied Overclocking Technology

This motherboard supports Untied Overclocking Technology, which means during overclocking, FSB enjoys better margin due to fixed PCI / PCIE buses. Before you enable Untied Overclocking function, please enter "Overclock Mode" option of BIOS setup to set the selection from [Auto] to [Manual]. Therefore, CPU FSB is untied during overclocking, but PCI / PCIE buses are in the fixed mode so that FSB can operate under a more stable overclocking environment.

Please refer to the warning on page 8 for the possible overclocking risk before you apply Untied Overclocking Technology.

Chapter 3 BIOS SETUP UTILITY

3.1 Introduction

This section explains how to use the BIOS SETUP UTILITY to configure your system. The SPI Memory on the motherboard stores the BIOS SETUP UTILITY. You may run the BIOS SETUP UTILITY when you start up the computer. Please press <F2> or <Del> during the Power-On-Self-Test (POST) to enter the BIOS SETUP UTILITY, otherwise, POST will continue with its test routines.

If you wish to enter the BIOS SETUP UTILITY after POST, restart the system by pressing <Ctl> + <Alt> + <Delete>, or by pressing the reset button on the system chassis. You may also restart by turning the system off and then back on.

Because the BIOS software is constantly being updated, the following BIOS setup screens and descriptions are for reference purpose only, and they may not exactly match what you see on your screen.

3.1.1 BIOS Menu Bar

The top of the screen has a menu bar with the following selections:

Main	To set up the system time/date information
OC Tweaker	To set up overclocking features
Advanced	To set up the advanced BIOS features
H/W Monitor	To display current hardware status
Boot	To set up the default system device to locate and load the Operating System
Security	To set up the security features
Exit	To exit the current screen or the BIOS SETUP UTILITY

Use < ← > key or < → > key to choose among the selections on the menu bar, and then press <Enter> to get into the sub screen.

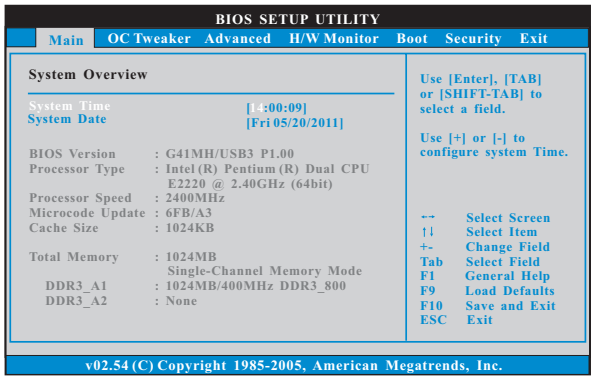
3.1.2 Navigation Keys

Please check the following table for the function description of each navigation key.

Navigation Key(s)	Function Description
← / →	Moves cursor left or right to select Screens
↑ / ↓	Moves cursor up or down to select items
+ / -	To change option for the selected items
<Enter>	To bring up the selected screen
<F1>	To display the General Help Screen
<F9>	To load optimal default values for all the settings
<F10>	To save changes and exit the BIOS SETUP UTILITY
<ESC>	To jump to the Exit Screen or exit the current screen

3.2 Main Screen

When you enter the BIOS SETUP UTILITY, the Main screen will appear and display the system overview



System Time [Hour:Minute:Second]

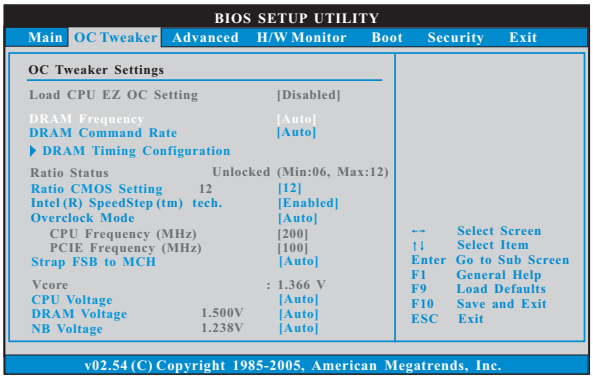
Use this item to specify the system time.

System Date [Day Month/Date/Year]

Use this item to specify the system date.

3.3 OC Tweaker Screen

In the OC Tweaker screen, you can set up overclocking features.


BIOS SETUP UTILITY
Main OC Tweaker Advanced H/W Monitor Boot Security Exit
OC Tweaker Settings
Load CPU EZ OC Setting [Disabled]
DRAM Frequency [Auto]
DRAM Command Rate [Auto]
DRAM Timing Configuration
Ratio Status Unlocked (Min:06, Max:12)
Ratio CMOS Setting 12 [12]
Intel (R) SpeedStep (tm) tech. [Enabled]
Overclock Mode [Auto]
CPU Frequency (MHz) [200]
PCIE Frequency (MHz) [100]
Strap FSB to MCH [Auto]
Vcore : 1.366 V
CPU Voltage [Auto]
DRAM Voltage 1.500V [Auto]
NB Voltage 1.238V [Auto]
→← Select Screen
↑↓ Select Item
Enter Go to Sub Screen
F1 General Help
F9 Load Defaults
F10 Save and Exit
ESC Exit
v02.54 (C) Copyright 1985-2005, American Megatrends, Inc.

Load CPU EZ OC Setting

You can use this option to load CPU EZ overclocking setting. Please note that overclocing may cause damage to your CPU and motherboard. It should be done at your own risk and expense.

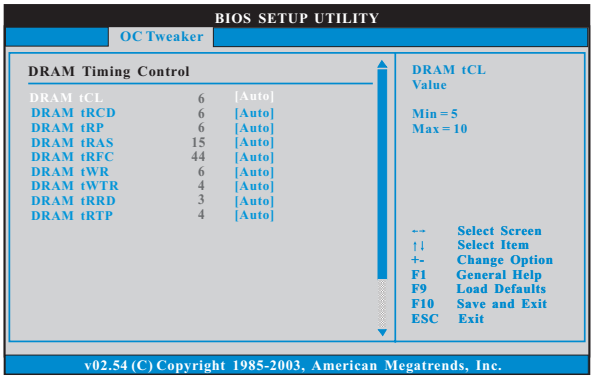
DRAM Frequency

If [Auto] is selected, the motherboard will detect the memory module(s) inserted and assigns appropriate frequency automatically. You may select [400MHz DDR3_800], [533MHz DDR3_1066] or [667MHz DDR3_1333]. The configuration options depend on the CPU and memory module you adopt on this motherboard. Please refer to page 8 for the CPU FSB frequency and its corresponding memory support frequency.

DRAM Command Rate

Use this item to adjust DRAM Command Rate. Configurationoptions: [1N], [2N] and [Auto].

DRAM Timing Configuration



DRAM tCL

This controls the number of DRAM clocks for TCL. Min: 5. Max: 10. The default value is [Auto].

DRAM tRCD

This controls the number of DRAM clocks for TRCD. Min: 3. Max: 10. The default value is [Auto].

DRAM tRP

This controls the number of DRAM clocks for TRP. Min: 3. Max: 10. The default value is [Auto].

DRAM tRAS

This controls the number of DRAM clocks for TRAS. Min: 9. Max: 24. The default value is [Auto].

DRAM tRFC

This controls the number of DRAM clocks for TRFC. Min: 15. Max: 78. The default value is [Auto].

DRAM tWR

This controls the number of DRAM clocks for TWR. Min: 3. Max: 15. The default value is [Auto].

DRAM tWTR

This controls the number of DRAM clocks for TWTR. Min: 2. Max: 15. The default value is [Auto].

DRAM tRRD

This controls the number of DRAM clocks for TRRD. Min: 2. Max: 15. The default value is [Auto].

DRAM tRTP

This controls the number of DRAM clocks for TRTP. Min: 2. Max: 13. The default value is [Auto].

Ratio Status

This is a read-only item, which displays whether the ratio status of this motherboard is “Locked” or “Unlocked”. If it shows “Unlocked”, you will find an item **Ratio CMOS Setting** appears to allow you changing the ratio value of this motherboard.

Ratio CMOS Setting

If the ratio status is unlocked, you will find this item appear to allow you changing the ratio value of this motherboard. If the CPU you adopt supports EIST (Intel (R) SpeedStep(tm) tech.), and you plan to adjust the ratio value, please disable the option “ Intel (R) SpeedStep(tm) tech.” in advance.

Intel (R) SpeedStep(tm) tech.

Intel (R) SpeedStep(tm) tech. is Intel’s new power saving technology. Processor can switch between multiple frequency and voltage points to enable power savings. The default value is [Auto]. Configuration options: [Auto], [Enabled] and [Disabled]. If you install Windows® XP and select [Auto], you need to set the “Power Schemes” as “Portable/Laptop” to enable this function. If you install Windows® Vista™ / 7 and want to enable this function, please set this item to [Enabled]. This item will be hidden if the current CPU does not support Intel (R) SpeedStep(tm) tech..

Please note that enabling this function may reduce CPU voltage and lead to system stability or compatibility issue with some power supplies. Please set this item to [Disable] if above issue occurs.

Overclock Mode

Use this to select Overclock Mode. Configuration options: [Auto], [Manual], [I.O.T.] and [Optimized]. The default value is [Auto]. If you select [Manual], Untied Overclocking function is enabled. Please refer to page 28 for the details of Untied Overclocking Technology. Therefore, you are allowed to adjust the Host frequency and PCIE frequency in the following two items. If you select [I.O.T.] (Intelligent Overclocking Technology), the system will automatically enable the overclocking function when your CPU is heavy loaded.

CPU Frequency (MHz)

Use this option to adjust CPU frequency.

PCIE Frequency (MHz)

Use this option to adjust PCIE frequency.

Strap FSB to MCH

Use this item to strap FSB to MCH. Configuration options: [Auto], [1066] and [1333].

CPU Voltage

Use this to select CPU Voltage. The default value of this feature is [Auto].

DRAM Voltage

Use this to select DRAM Voltage. The default value of this feature is [Auto].

NB Voltage

Use this to select NB Voltage. The default value of this feature is [Auto].

SB Voltage

Use this to select SB Voltage. The default value of this feature is [Auto].

VTT Voltage

Use this to select VTT Voltage. The default value of this feature is [Auto].

GLTREF Voltage

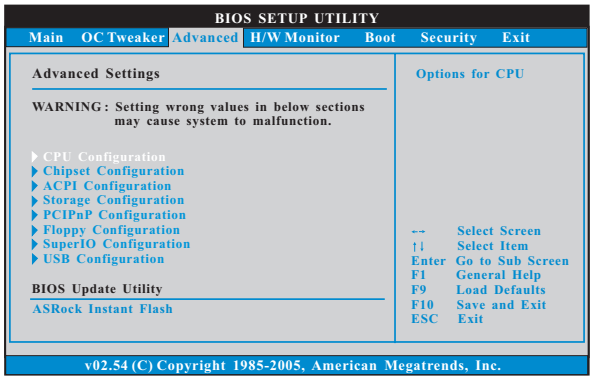
Use this to select GLTREF Voltage. The default value of this feature is [Auto].

Would you like to save current setting user defaults?

In this option, you are allowed to load and save three user defaults according to your own requirements.

3.4 Advanced Screen

In this section, you may set the configurations for the following items: CPU Configuration, Chipset Configuration, ACPI Configuration, Storage Configuration, PCIPnP Configuration, Floppy Configuration, SuperIO Configuration, and USB Configuration.

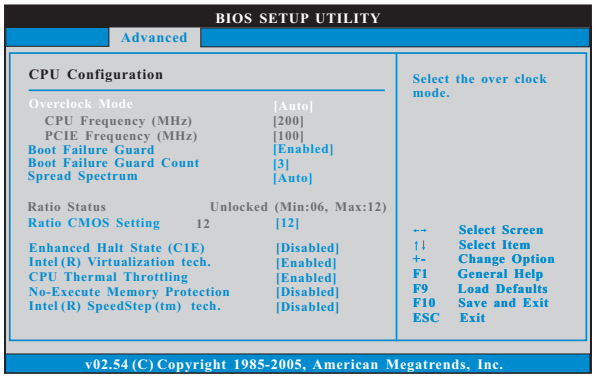


Setting wrong values in this section may cause the system to malfunction.

ASRock Instant Flash

ASRock Instant Flash is a BIOS flash utility embedded in Flash ROM. This convenient BIOS update tool allows you to update system BIOS without entering operating systems first like MS-DOS or Windows®. Just launch this tool and save the new BIOS file to your USB flash drive, floppy disk or hard drive, then you can update your BIOS only in a few clicks without preparing an additional floppy diskette or other complicated flash utility. Please be noted that the USB flash drive or hard drive must use FAT32/16/12 file system. If you execute ASRock Instant Flash utility, the utility will show the BIOS files and their respective information. Select the proper BIOS file to update your BIOS, and reboot your system after BIOS update process completes.

3.4.1 CPU Configuration



Overclock Mode

Use this to select Overclock Mode. Configuration options: [Auto], [Manual], [I.O.T.] and [Optimized]. The default value is [Auto]. If you select [Manual], Untied Overclocking function is enabled. Please refer to page 28 for the details of Untied Overclocking Technology. Therefore, you are allowed to adjust the Host frequency and PCIE frequency in the following two items. If you select [I.O.T.] (Intelligent Overclocking Technology), the system will automatically enable the overclocking function when your CPU is heavy loaded.

CPU Frequency (MHz)

Use this option to adjust CPU frequency.

PCIE Frequency (MHz)

Use this option to adjust PCIE frequency.

Boot Failure Guard

Enable or disable the feature of Boot Failure Guard.

Boot Failure Guard Count

Enable or disable the feature of Boot Failure Guard Count.

Spread Spectrum

This item should always be [Auto] for better system stability.

Ratio Status

This is a read-only item, which displays whether the ratio status of this motherboard is “Locked” or “Unlocked”. If it shows “Unlocked”, you will find an item **Ratio CMOS Setting** appears to allow you changing the ratio value of this motherboard.

Ratio CMOS Setting

If the ratio status is unlocked, you will find this item appear to allow you changing the ratio value of this motherboard. If the CPU you adopt supports

EIST (Intel (R) SpeedStep(tm) tech.), and you plan to adjust the ratio value, please disable the option " Intel (R) SpeedStep(tm) tech." in advance.

Enhance Halt State (C1E)

All processors support the Halt State (C1). The C1 state is supported through the native processor instructions HLT and MWAIT and requires no hardware support from the chipset. In the C1 power state, the processor maintains the context of the system caches.

Intel (R) Virtualization tech.

When this option is set to [Enabled], a VMM (Virtual Machine Architecture) can utilize the additional hardware capabilities provided by Vanderpool Technology. This option will be hidden if the installed CPU does not support Intel (R) Virtualization Technology.

CPU Thermal Throttling

You may select [Enabled] to enable P4 CPU internal thermal control mechanism to keep the CPU from overheated. This option will be hidden if the current CPU does not support CPU Thermal Throttling.

No-Excute Memory Protection

No-Execution (NX) Memory Protection Technology is an enhancement to the IA-32 Intel Architecture. An IA-32 processor with "No Execute (NX) Memory Protection" can prevent data pages from being used by malicious software to execute code. This option will be hidden if the current CPU does not support No-Excute Memory Protection.

Hyper Threading Technology

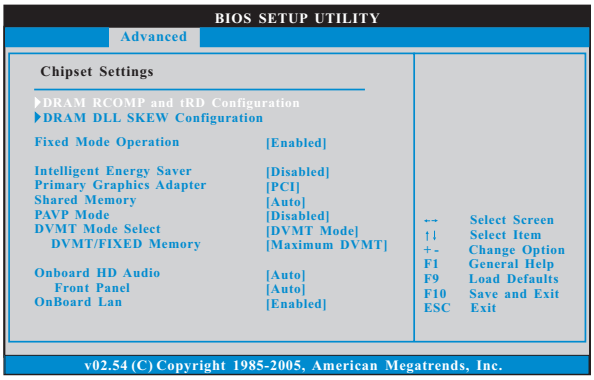
To enable this feature, it requires a computer system with an Intel Pentium® 4 processor that supports Hyper-Threading technology and an operating system that includes optimization for this technology, such as Microsoft® Windows® XP / Vista™ / 7. Set to [Enabled] if using Microsoft® Windows® XP, Vista™, 7 or Linux kernel version 2.4.18 or higher. This option will be hidden if the installed CPU does not support Hyper-Threading technology.

Intel (R) SpeedStep(tm) tech.

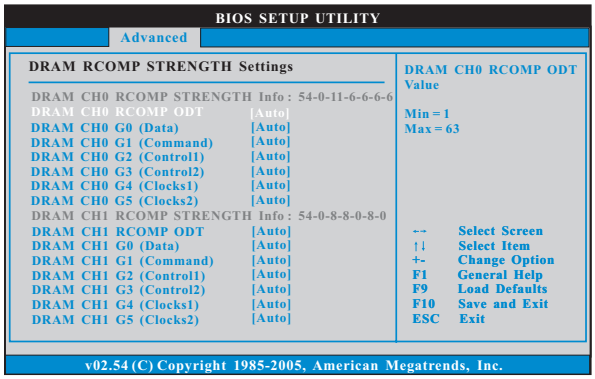
Intel (R) SpeedStep(tm) tech. is Intel's new power saving technology. Processor can switch between multiple frequency and voltage points to enable power savings. The default value is [Auto]. Configuration options: [Auto], [Enabled] and [Disabled]. If you install Windows® XP and select [Auto], you need to set the "Power Schemes" as "Portable/Laptop" to enable this function. If you install Windows® 7 / Vista™ and want to enable this function, please set this item to [Enabled]. This item will be hidden if the current CPU does not support Intel (R) SpeedStep(tm) tech..

Please note that enabling this function may reduce CPU voltage and lead to system stability or compatibility issue with some power supplies. Please set this item to [Disable] if above issue occurs.

3.4.2 Chipset Configuration



DRAM RCOMP and tRD Configuration


BIOS SETUP UTILITY
Advanced
DRAM RCOMP STRENGTH Settings
DRAM CH0 RCOMP STRENGTH Info : 54-0-11-6-6-6-6
DRAM CH0 RCOMP ODT [Auto]
DRAM CH0 G0 (Data) [Auto]
DRAM CH0 G1 (Command) [Auto]
DRAM CH0 G2 (Control1) [Auto]
DRAM CH0 G3 (Control2) [Auto]
DRAM CH0 G4 (Clocks1) [Auto]
DRAM CH0 G5 (Clocks2) [Auto]
DRAM CH1 RCOMP STRENGTH Info : 54-0-8-8-0-8-0
DRAM CH1 RCOMP ODT [Auto]
DRAM CH1 G0 (Data) [Auto]
DRAM CH1 G1 (Command) [Auto]
DRAM CH1 G2 (Control1) [Auto]
DRAM CH1 G3 (Control2) [Auto]
DRAM CH1 G4 (Clocks1) [Auto]
DRAM CH1 G5 (Clocks2) [Auto]
DRAM CH0 RCOMP ODT Value
Min = 1
Max = 63
Select Screen
Select Item
Change Option
General Help
Load Defaults
Save and Exit
Exit
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DRAM CH0 RCOMP ODT

This controls the number of DRAM CH0 RCOMP ODT. Min: 1. Max: 63. The default value is [Auto].

DRAM CH0 G0 (Data)

This controls the number of DRAM CH0 G0 (Data). Min: 1. Max: 15. The default value is [Auto].

DRAM CH0 G1 (Command)

This controls the number of DRAM CH0 G1 (Command). Min: 1. Max: 15. The default value is [Auto].

DRAM CH0 G2 (Control1)

This controls the number of DRAM CH0 G2 (Control1). Min: 1. Max: 15. The default value is [Auto].

DRAM CH0 G3 (Control2)

This controls the number of DRAM CH0 G3 (Control2). Min: 1. Max: 15. The default value is [Auto].

DRAM CH0 G4 (Clocks1)

This controls the number of DRAM CH0 G4 (Clocks1). Min: 1. Max: 15. The default value is [Auto].

DRAM CH0 G5 (Clocks2)

This controls the number of DRAM CH0 G5 (Clocks2). Min: 1. Max: 15. The default value is [Auto].

DRAM CH1 RCOMP ODT

This controls the number of DRAM CH1 RCOMP ODT. Min: 1. Max: 63. The default value is [Auto].

DRAM CH1 G0 (Data)

This controls the number of DRAM CH1 G0 (Data). Min: 1. Max: 15. The default value is [Auto].

DRAM CH1 G1 (Command)

This controls the number of DRAM CH1 G1 (Command). Min: 1. Max: 15. The default value is [Auto].

DRAM CH1 G2 (Control1)

This controls the number of DRAM CH1 G2 (Control1). Min: 1. Max: 15. The default value is [Auto].

DRAM CH1 G3 (Control2)

This controls the number of DRAM CH1 G3 (Control2). Min: 1. Max: 15. The default value is [Auto].

DRAM CH1 G4 (Clocks1)

This controls the number of DRAM CH1 G4 (Clocks1). Min: 1. Max: 15. The default value is [Auto].

DRAM CH1 G5 (Clocks2)

This controls the number of DRAM CH1 G5 (Clocks2). Min: 1. Max: 15. The default value is [Auto].

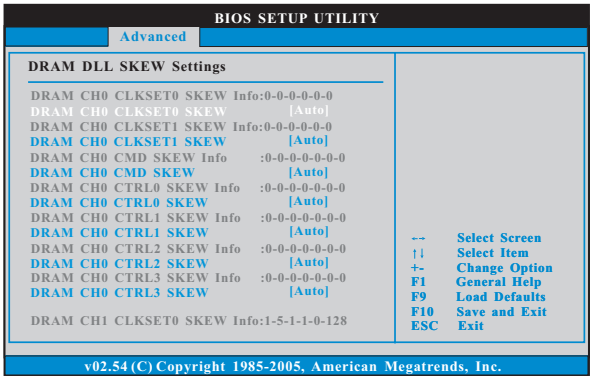
DRAM CH0 tRD

This controls the number of DRAM CH0 tRD. Min: 0. Max: 30. The default value is [Auto].

DRAM CH1 tRD

This controls the number of DRAM CH1 tRD. Min: 0. Max: 30. The default value is [Auto].

DRAM DLL SKEW Configuration


BIOS SETUP UTILITY
Advanced
DRAM DLL SKEW Settings
DRAM CH0 CLKSET0 SKEW Info:0-0-0-0-0-0
DRAM CH0 CLKSET0 SKEW [Auto]
DRAM CH0 CLKSET1 SKEW Info:0-0-0-0-0-0
DRAM CH0 CLKSET1 SKEW [Auto]
DRAM CH0 CMD SKEW Info :0-0-0-0-0-0-0
DRAM CH0 CMD SKEW [Auto]
DRAM CH0 CTRL0 SKEW Info :0-0-0-0-0-0-0
DRAM CH0 CTRL0 SKEW [Auto]
DRAM CH0 CTRL1 SKEW Info :0-0-0-0-0-0-0
DRAM CH0 CTRL1 SKEW [Auto]
DRAM CH0 CTRL2 SKEW Info :0-0-0-0-0-0-0
DRAM CH0 CTRL2 SKEW [Auto]
DRAM CH0 CTRL3 SKEW Info :0-0-0-0-0-0-0
DRAM CH0 CTRL3 SKEW [Auto]
DRAM CH1 CLKSET0 SKEW Info:1-5-1-1-0-128
→← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F9 Load Defaults
F10 Save and Exit
ESC Exit
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DRAM CH0 CLKSET0 SKEW

This controls the number of DRAM CH0 CLKSET0 SKEW. The default value is [Auto].

DRAM CH0 CLKSET1 SKEW

This controls the number of DRAM CH0 CLKSET1 SKEW. The default value is [Auto].

DRAM CH0 CMD SKEW

This controls the number of DRAM CH0 CMD SKEW. The default value is [Auto].

DRAM CH0 CTRL0 SKEW

This controls the number of DRAM CH0 CTRL0 SKEW. The default value is [Auto].

DRAM CH0 CTRL1 SKEW

This controls the number of DRAM CH0 CTRL1 SKEW. The default value is [Auto].

DRAM CH0 CTRL2 SKEW

This controls the number of DRAM CH0 CTRL2 SKEW. The default value is [Auto].

DRAM CH0 CTRL3 SKEW

This controls the number of DRAM CH0 CTRL3 SKEW. The default value is [Auto].

DRAM CH1 CLKSET0 SKEW

This controls the number of DRAM CH1 CLKSET0 SKEW. The default value is [Auto].

DRAM CH1 CLKSET1 SKEW

This controls the number of DRAM CH1 CLKSET1 SKEW. The default value is [Auto].

DRAM CH1 CMD SKEW

This controls the number of DRAM CH1 CMD SKEW. The default value is [Auto].

DRAM CH1 CTRL0 SKEW

This controls the number of DRAM CH1 CTRL0 SKEW. The default value is [Auto].

DRAM CH1 CTRL1 SKEW

This controls the number of DRAM CH1 CTRL1 SKEW. The default value is [Auto].

DRAM CH1 CTRL2 SKEW

This controls the number of DRAM CH1 CTRL2 SKEW. The default value is [Auto].

DRAM CH1 CTRL3 SKEW

This controls the number of DRAM CH1 CTRL3 SKEW. The default value is [Auto].

Flex Mode Operation

This allows you to enable or disable flex mode operation feature. The default value is [Enabled]. Configuration options: [Enabled] and [Disabled].

Intelligent Energy Saver

Intelligent Energy Saver is a revolutionary technology that delivers unparalleled power savings. The default value is [Disabled]. Configuration options: [Enabled] and [Disabled]. If you want to enable this function, please set this item to [Enabled]. Besides the BIOS option, you can also choose our Intelligent Energy Saver utility to enable this function.

Primary Graphics Adapter

This allows you to select [Onboard], [PCI] or [PCI Express] as the boot graphic adapter priority. The default value is [PCI].

Share Memory

This allows you to set share memory feature. The default value is [Auto]. Configuration options: [Auto], [32MB], [64MB], [128MB] and [256MB].

PAVP Mode

Use this option to adjust PAVP mode. Configuration options: [Disabled] and [Lite]. The default value is [Disabled]. PAVP is the new graphics feature in Intel® 4 Series Express chipset family to support increased content protection and robustness requirements for premium content playback (Blu-ray disc). [Lite] mode is the encryption of compressed video buffer and is hardware-based 128-bit AES decryption.

DVMT Mode Select

Use this option to adjust DVMT mode. The default value is [DVMT Mode]. DVMT (Dynamic Video Memory Technology) is an architecture that offers breakthrough performance for the motherboard through efficient memory utilization. In DVMT mode, the graphics driver allocates memory as needed for running graphics applications and is cooperatively using this memory with other system components. This item will not be used under Windows® 7 / Vista™ OS because the driver will intelligently detect physical memory available and allocate necessary video memory.

DVMT/FIXED Memory

You are allowed to adjust the shared memory size in this item if you set DVMT Mode Select as [DVMT Mode]. Configuration options: [128MB], [256MB] and [Maximum DVMT]. The option [Maximum DVMT] only appears when you adopt the memory module with 1024MB or above.

Onboard HD Audio

Select [Auto], [Enabled] or [Disabled] for the onboard HD Audio feature. If you select [Auto], the onboard HD Audio will be disabled when PCI Sound Card is plugged.

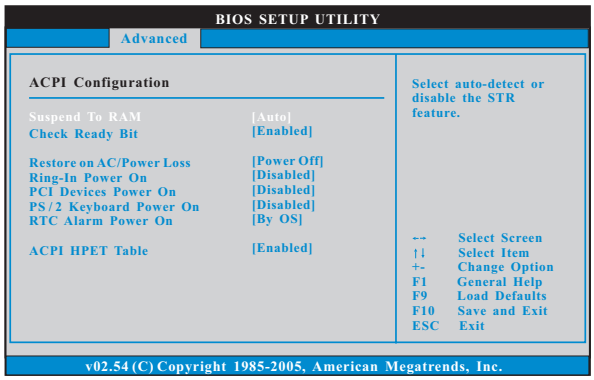
Front Panel

Select [Auto] or [Disabled] for the onboard HD Audio Front Panel.

OnBoard Lan

This allows you to enable or disable the “OnBoard Lan” feature.

3.4.3 ACPI Configuration


BIOS SETUP UTILITY
Advanced
ACPI Configuration
Suspend To RAM [Auto]
Check Ready Bit [Enabled]
Restore on AC/Power Loss [Power Off]
Ring-In Power On [Disabled]
PCI Devices Power On [Disabled]
PS/2 Keyboard Power On [Disabled]
RTC Alarm Power On [By OS]
ACPI HPET Table [Enabled]
Select auto-detect or disable the STR feature.
←→ Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F9 Load Defaults
F10 Save and Exit
ESC Exit
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Suspend to RAM

Use this item to select whether to auto-detect or disable the Suspend-to-RAM feature. Select [Auto] will enable this feature if the OS supports it.

Check Ready Bit

Use this item to enable or disable the feature Check Ready Bit.

Restore on AC/Power Loss

This allows you to set the power state after an unexpected AC/Power loss. If [Power Off] is selected, the AC/Power remains off when the power recovers. If [Power On] is selected, the AC/Power resumes and the system starts to boot up when the power recovers.

Ring-In Power On

Use this item to enable or disable Ring-In signals to turn on the system from the power-soft-off mode.

PCI Devices Power On

Use this item to enable or disable PCI devices to turn on the system from the power-soft-off mode.

PS/2 Keyboard Power On

Use this item to enable or disable PS/2 keyboard to turn on the system from the power-soft-off mode.

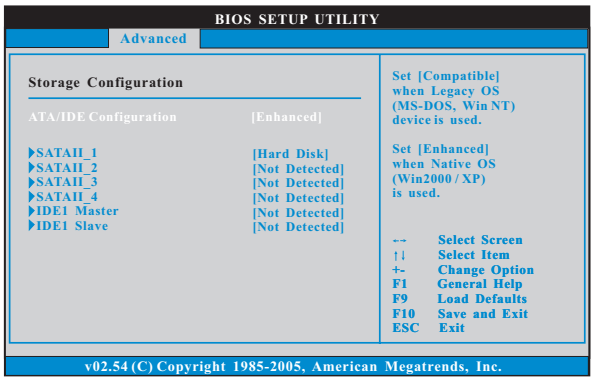
RTC Alarm Power On

Use this item to enable or disable RTC (Real Time Clock) to power on the system.

ACPI HPET Table

Use this item to enable or disable ACPI HPET Table. The default value is [Disabled]. Please set this option to [Enabled] if you plan to use this motherboard to submit Windows® Vista™ certification.

3.4.4 Storage Configuration



ATA/IDE Configuration

Please select [**Compatible**] when you install legacy OS (Windows® NT). If native OS (Windows® 7 / Vista™ / XP) is installed, please select [**Enhanced**].

When [**Compatible**] is selected

Combined Option

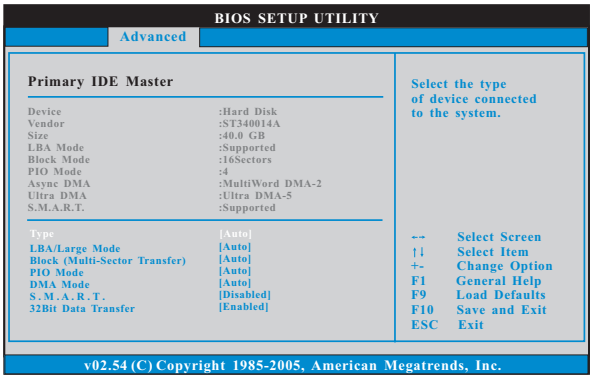
It allows you to select between [**SATA 1, SATA 2, SATA 3, SATA 4**], [**SATA 1, SATA 3, IDE 1**], [**IDE 1, SATA 2, SATA 4**] and [**PATA Only**]. If it is set to [SATA 1, SATA 3, IDE 1], then SATAII_2, SATAII_4 will not work. Likewise, if it is set to [IDE 1, SATA 2, SATA 4], then SATAII_1, SATAII_3 will not work. If you select [**PATA Only**], then all SATAII will not work, only IDE will work.

Because Intel® ICH7 south bridge only supports four IDE devices under legacy OS (Windows NT), you have to choose [SATA 1, SATA 2, SATA 3, SATA 4], [SATA 1, SATA 3, IDE 1], or [IDE 1, SATA 2, SATA 4] when the installed device is used with legacy OS.

	[SATA 1, SATA 2, SATA 3, SATA 4]	[SATA 1, SATA 3, IDE 1]	[IDE 1, SATA 2, SATA 4]
Master	SATAII 1, SATAII 2	SATAII 1	SATAII 2
Slave	SATAII 3, SATAII 4	SATAII 3	SATAII 4

Storage Device Configuration

You may set the storage configuration for the device that you specify. We will use the “Primary IDE Master” as the example in the following instruction.



TYPE

Use this item to configure the type of the IDE device that you specify. Configuration options: [Not Installed], [Auto], [CD/DVD], and [ARMD].

[Not Installed]: Select [Not Installed] to disable the use of IDE device.

[Auto]: Select [Auto] to automatically detect the hard disk drive.

After selecting the hard disk information into BIOS, use a disk utility, such as FDISK, to partition and format the new IDE hard disk drives. This is necessary so that you can write or read data from the hard disk. Make sure to set the partition of the Primary IDE hard disk drives to active.

[CD/DVD]: This is used for IDE CD/DVD drives.

[ARMD]: This is used for IDE ARMD (ATAPI Removable Media Device), such as MO.

LBA/Large Mode

Use this item to select the LBA/Large mode for a hard disk > 512 MB under DOS and Windows; for Netware and UNIX user, select [Disabled] to disable the LBA/Large mode.

Block (Multi-Sector Transfer)

The default value of this item is [Auto]. If this feature is enabled, it will enhance hard disk performance by reading or writing more data during each transfer.

PIO Mode

Use this item to set the PIO mode to enhance hard disk performance by optimizing the hard disk timing.

DMA Mode

DMA capability allows the improved transfer-speed and data-integrity for compatible IDE devices.

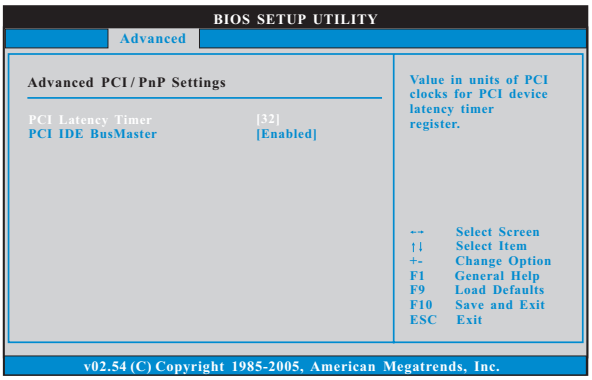
S.M.A.R.T.

Use this item to enable or disable the S.M.A.R.T. (Self-Monitoring, Analysis, and Reporting Technology) feature. Configuration options: [Disabled], [Auto], [Enabled].

32-Bit Data Transfer

Use this item to enable 32-bit access to maximize the IDE hard disk data transfer rate.

3.4.5 PCIPnP Configuration


BIOS SETUP UTILITY
Advanced
Advanced PCI / PnP Settings
PCI Latency Timer [32]
PCI IDE BusMaster [Enabled]
Value in units of PCI clocks for PCI device latency timer register.
←→ Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F9 Load Defaults
F10 Save and Exit
ESC Exit
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PCI Latency Timer

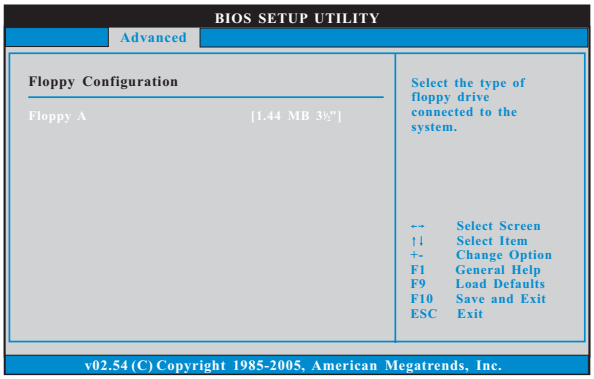
The default value is 32. It is recommended to keep the default value unless the installed PCI expansion cards' specifications require other settings.

PCI IDE BusMaster

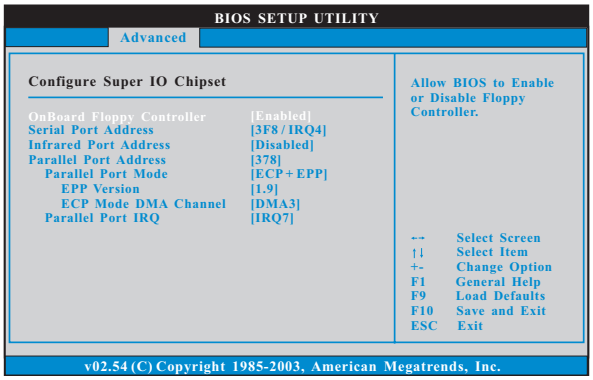
Use this item to enable or disable the PCI IDE BusMaster feature.

3.4.6 Floppy Configuration

In this section, you may configure the type of your floppy drive.



3.4.7 Super IO Configuration


BIOS SETUP UTILITY
Advanced
Configure Super IO Chipset
OnBoard Floppy Controller [Enabled]
Serial Port Address [3F8 / IRQ4]
Infrared Port Address [Disabled]
Parallel Port Address [378]
Parallel Port Mode [ECP + EPP]
EPP Version [1.9]
ECP Mode DMA Channel [DMA3]
Parallel Port IRQ [IRQ7]
Allow BIOS to Enable or Disable Floppy Controller.
←→ Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F9 Load Defaults
F10 Save and Exit
ESC Exit
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OnBoard Floppy Controller

Use this item to enable or disable floppy drive controller.

Serial Port Address

Use this item to set the address for the onboard serial port or disable it. Configuration options: [Disabled], [3F8 / IRQ4], [2F8 / IRQ3], [3E8 / IRQ4], [2E8 / IRQ3].

Infrared Port Address

Use this item to set the address for the onboard infrared port or disable it. Configuration options: [Disabled], [2F8 / IRQ3], and [2E8 / IRQ3].

Parallel Port Address

Use this item to set the address for the onboard parallel port or disable it. Configuration options: [Disabled], [378], and [278].

Parallel Port Mode

Use this item to set the operation mode of the parallel port. The default value is [ECP+EPP]. If this option is set to [ECP+EPP], it will show the EPP version in the following item, "EPP Version". Configuration options: [Normal], [Bi-Directional], and [ECP+EPP].

EPP Version

Use this item to set the EPP version. Configuration options: [1.9] and [1.7].

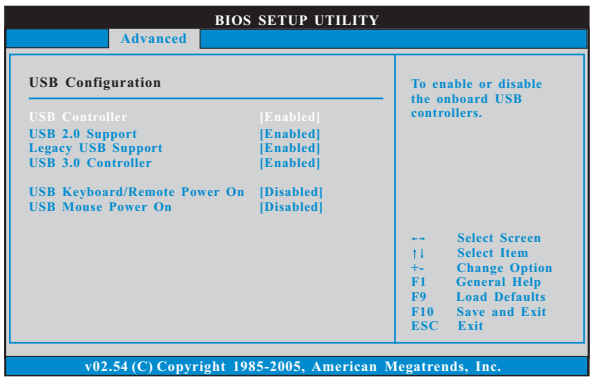
ECP Mode DMA Channel

Use this item to set the ECP mode DMA channel. Configuration options: [DMA0], [DMA1], and [DMA3].

Parallel Port IRQ

Use this item to set the IRQ for the parallel port. Configuration options: [IRQ5] and [IRQ7].

3.4.8 USB Configuration



USB Controller

Use this item to enable or disable the use of USB controller.

USB 2.0 Support

Use this item to enable or disable the USB 2.0 support.

Legacy USB Support

Use this option to select legacy support for USB devices. There are four configuration options: [Enabled], [Auto], [Disabled] and [BIOS Setup Only]. The default value is [Enabled]. Please refer to below descriptions for the details of these four options:

[Enabled] - Enables support for legacy USB.

[Auto] - Enables legacy support if USB devices are connected.

[Disabled] - USB devices are not allowed to use under legacy OS and BIOS setup when [Disabled] is selected. If you have USB compatibility issue, it is recommended to select [Disabled] to enter OS.

[BIOS Setup Only] - USB devices are allowed to use only under BIOS setup and Windows / Linux OS.

USB 3.0 Controller

Use this item to enable or disable the use of USB 3.0 controller.

USB Keyboard/Remote Power On

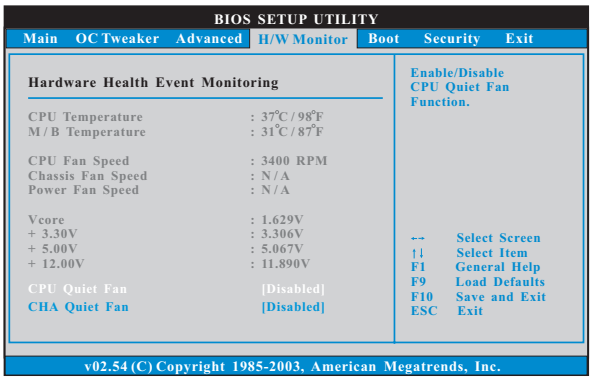
Use this item to enable or disable USB Keyboard/Remote Power On on the system.

USB Mouse Power On

Use this item to enable or disable USB Mouse Power On on the system.

3.5 Hardware Health Event Monitoring Screen

In this section, it allows you to monitor the status of the hardware on your system, including the parameters of the CPU temperature, motherboard temperature, CPU fan speed, chassis fan speed, and the critical voltage.


BIOS SETUP UTILITY
Main OC Tweaker Advanced H/W Monitor Boot Security Exit
Hardware Health Event Monitoring
CPU Temperature : 37°C / 98°F
M/B Temperature : 31°C / 87°F
CPU Fan Speed : 3400 RPM
Chassis Fan Speed : N/A
Power Fan Speed : N/A
Vcore : 1.629V
+ 3.30V : 3.306V
+ 5.00V : 5.067V
+ 12.00V : 11.890V
CPU Quiet Fan [Disabled]
CHA Quiet Fan [Disabled]
Enable/Disable CPU Quiet Fan Function.
↔ Select Screen
↑↓ Select Item
F1 General Help
F9 Load Defaults
F10 Save and Exit
ESC Exit
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CPU Quiet Fan

This item allows you to identify the temperature of CPU fan. If you set this option as [Disabled], the CPU fan will operate in full speed. If you set this option as [Enabled], you will find the items “Target CPU Temperature” and “Target Fan Speed” appear to allow you adjusting them. The default value is [Disabled]. You are allowed to enable this function only when you install 4-pin CPU fan.

Target CPU Temperature

The target temperature will be between 45° C/113° F and 65° C/149° F. The default value is [50° C/122° F].

Target Fan Speed

Use this option to set the target fan speed. You can freely adjust the target fan speed according to the target CPU temperature that you choose. The default value is [Level 9]. Configuration options: [Level 1] to [Level 9].

CHA Quiet Fan

This item allows you to identify the temperature of chassis fan. If you set this option as [Disabled], the chassis fan will operate in full speed. If you set this option as [Enabled], you will find the items “Target M/B Temperature” and “Target Fan Speed” appear to allow you adjusting them. The default value is [Disabled]. You are allowed to enable this function only when you install 4-pin chassis fan.

Target M/B Temperature

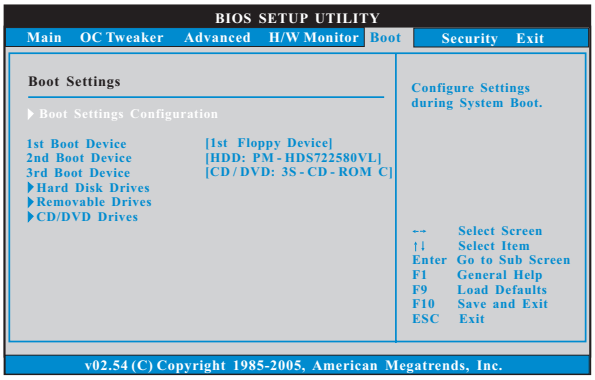
The target temperature will be between 45° C/113° F and 65° C/149° F. The default value is [50° C/122° F].

Target Fan Speed

Use this option to set the target fan speed. You can freely adjust the target fan speed according to the target chassis temperature that you choose. The default value is [Level 9]. Configuration options: [Level 1] to [Level 9].

3.6 Boot Screen

In this section, it will display the available devices on your system for you to configure the boot settings and the boot priority.


BIOS SETUP UTILITY
Main OC Tweaker Advanced H/W Monitor Boot Security Exit
Boot Settings
Boot Settings Configuration
1st Boot Device [1st Floppy Device]
2nd Boot Device [HDD: PM-HDS722580VL]
3rd Boot Device [CD/DVD: 3S-CD-ROM C]
Hard Disk Drives
Removable Drives
CD/DVD Drives
Configure Settings during System Boot.
↔ Select Screen
↑↓ Select Item
Enter Go to Sub Screen
F1 General Help
F9 Load Defaults
F10 Save and Exit
ESC Exit
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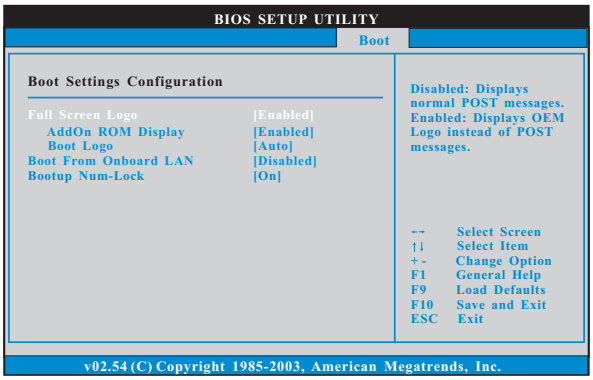
3.6.1 Boot Settings Configuration



Full Screen Logo

Use this item to enable or disable OEM Logo. The default value is [Enabled].

AddOn ROM Display

Use this option to adjust AddOn ROM Display. If you enable the option "Full Screen Logo" but you want to see the AddOn ROM information when the system boots, please select [Enabled]. Configuration options: [Enabled] and [Disabled]. The default value is [Enabled].

Boot Logo

Use this option to select logo in POST screen. This option only appears when you enable the option "Full Screen Logo". Configuration options: [Auto], [EuP], [Scenery] and [ASRock]. The default value is [Auto].

Boot From Onboard LAN

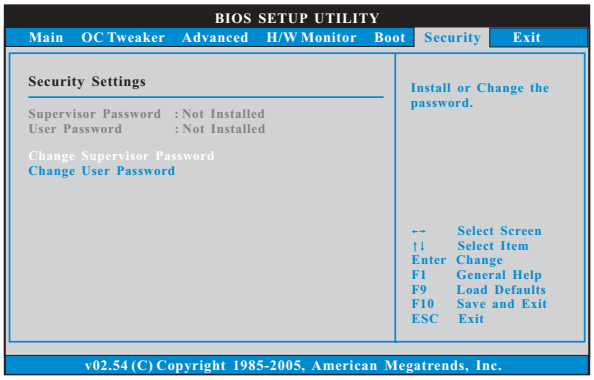
Use this item to enable or disable the Boot From Onboard LAN feature.

Boot Up Num-Lock

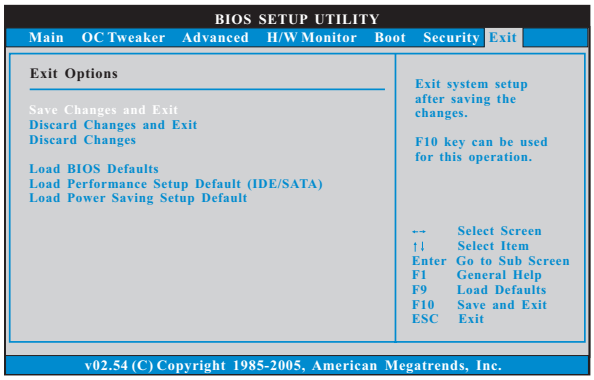
If this item is set to [On], it will automatically activate the Numeric Lock function after boot-up.

3.7 Security Screen

In this section, you may set or change the supervisor/user password for the system. For the user password, you may also clear it.



3.8 Exit Screen


BIOS SETUP UTILITY
Main OC Tweaker Advanced H/W Monitor Boot Security Exit
Exit Options
Save Changes and Exit
Discard Changes and Exit
Discard Changes
Load BIOS Defaults
Load Performance Setup Default (IDE/SATA)
Load Power Saving Setup Default
Exit system setup after saving the changes.
F10 key can be used for this operation.
↔ Select Screen
↑↓ Select Item
Enter Go to Sub Screen
F1 General Help
F9 Load Defaults
F10 Save and Exit
ESC Exit
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Save Changes and Exit

When you select this option, it will pop-out the following message, "Save configuration changes and exit setup?" Select [OK] to save the changes and exit the BIOS SETUP UTILITY.

Discard Changes and Exit

When you select this option, it will pop-out the following message, "Discard changes and exit setup?" Select [OK] to exit the BIOS SETUP UTILITY without saving any changes.

Discard Changes

When you select this option, it will pop-out the following message, "Discard changes?" Select [OK] to discard all changes.

Load BIOS Defaults

Load BIOS default values for all the setup questions. F9 key can be used for this operation.

Load Performance Setup Default (IDE/SATA)

This performance setup default may not be compatible with all system configurations. If system boot failure occurs after loading, please resume optimal default settings. F5 key can be used for this operation.

Load Power Saving Setup Default

Load power saving setup default. F6 key can be used for this operation.

Chapter 4: Software Support

4.1 Install Operating System

This motherboard supports various Microsoft® Windows® operating systems: 7 / 7 64-bit / Vista™ / Vista™ 64-bit / XP / XP 64-bit. Because motherboard settings and hardware options vary, use the setup procedures in this chapter for general reference only. Refer to your OS documentation for more information.

4.2 Support CD Information

The Support CD that came with the motherboard contains necessary drivers and useful utilities that enhance the motherboard features.

4.2.1 Running The Support CD

To begin using the support CD, insert the CD into your CD-ROM drive. The CD automatically displays the Main Menu if "AUTORUN" is enabled in your computer. If the Main Menu did not appear automatically, locate and double click on the file "ASSETUP.EXE" from the BIN folder in the Support CD to display the menus.

4.2.2 Drivers Menu

The Drivers Menu shows the available devices drivers if the system detects installed devices. Please install the necessary drivers to activate the devices.

4.2.3 Utilities Menu

The Utilities Menu shows the applications software that the motherboard supports. Click on a specific item then follow the installation wizard to install it.

4.2.4 Contact Information

If you need to contact ASRock or want to know more about ASRock, welcome to visit ASRock's website at http://www.asrock.com; or you may contact your dealer for further information.